CLAIMS

1. A gas phase olefin polymerization process comprising:

(1) preparing a solution of a catalyst precursor comprising a mixture of magnesium and titanium compounds, an electron donor and a solvent;

(2) adding a filler to the solution from step (1) to form a slurry;

(3) spray drying the slurry from step (2) at a temperature of 100 to 140°C to form a spray dried precursor;

(4) slurrying the spray dried precursor from step (3) in mineral oil,

(5) partially or fully pre-activating the catalyst precursor by contacting the slurry of (4) with one or more Lewis Acids, and

(6) transferring the partially or fully activated precursor from step (5) into a gas phase reactor in which an olefin polymerization reaction is in progress.

2. A gas phase olefin polymerization process comprising:

(1) preparing a solution of a catalyst precursor comprising a mixture of magnesium and titanium compounds, an electron donor and a solvent;

(2) adding a porous catalyst support, to the solution from step (1) to form a slurry;

(3) drying the slurry from step (2) to form a solid catalyst precursor;

(4) slurrying the solid precursor from step (3) in a viscous inert liquid,

(5) partially or fully pre-activating the catalyst precursor by contacting the slurry of (4) with one or more Lewis Acids, and

(6) transferring the partially or fully activated precursor from step (5) into a gas phase reactor in which an olefin polymerization reaction is in progress.

3. The process of Claim 1 or 2 wherein;

1) the catalyst precursor in step (1) corresponds to the formula:

$$Mg_d(M)(OR)_e X_f (ED)_g$$

wherein R is an aliphatic or aromatic hydrocarbon radical having 1 to 14 carbon atoms or COR′ wherein R′ is a aliphatic or aromatic hydrocarbon radical having 1 to 14 carbon atoms and each OR group is the same or different;

M is a transition metal;

X is independently chlorine, bromine or iodine;

ED is an electron donor;

d is 0.5 to 56; e is 0, 1, or 2; f is 2 to 116; g is >2 and up to 1.5(d) + 3; and

2) the Lewis Acid of step (5) is

i) one or more compounds with formula $M'(R''_n)X_{(3-n)}$ wherein M' is aluminum or boron; each X is independently chlorine, bromine, or iodine; each R" is independently a saturated aliphatic hydrocarbon radical having 1 to 14 carbon atoms, provided that when M is aluminum, n is 1 to 3 and when M is boron, n is 0 to 1.5; and

ii) is added in an amount such that the mole ratio of total Lewis Acid to electron donor in the precursor is from 0.10:1 to 1.0:1.

4. The process of Claim 1 or 2, wherein said Lewis Acid is;

1) one or more alklyaluminum compound(s) with formula $M'(R''_n)X_{(3-n)}$ wherein M' is aluminum, R" is n-butyl, n-hexyl, n-octyl, iso-octyl, isohexyl, and n-decyl, X is Cl or Br and n is a number from 0 to 1.5; and

2) added in an amount such that the mole ratio of total Lewis Acid to electron donor in the precursor is from 0.10:1 to 0.75:1.

5. The process of Claim 4, wherein said Lewis Acid is;

1) selected from the group consisting triethylaluminum, tri-n-butyl aluminum, tri-n-hexyl aluminum, tri-n-octyl aluminum, tri n-decyl aluminum, triisoprenyl aluminum, dimethyl aluminum chloride, ethylaluminum dichloride, diethylaluminum chloride, and mixtures thereof; and

2) added in an amount such that the mole ratio of total Lewis Acid to electron donor in the precursor is from 0.10:1 to 0.30:1.

6. The process of Claim 4 wherein said Lewis Acid is a sequential mixture of tri-n-hexylaluminum and diethylaluminum chloride; a sequential mixture of triethylaluminum and diethylaluminum chloride; a sequential mixture of diethylaluminum chloride and tri-n-hexylaluminum; or a sequential mixture of diethylaluminum chloride and triethylaluminum.

7. The process of Claim 1 or 2 wherein the amount of polymer fines produced in said gas phase polymerization is at least 10 percent less than the amount produced in an analogous process but without the pre-activation of step (5).

8. The process of Claim 1 or 2 in which the slurry of (2) is intimately mixed with the Lewis Acid by use of a static mixer.

9. The process of Claim 1 or 2 in which said a gas phase reactor is in a single reactor configuration.

10. The process of Claim 1 or 2 in which said a gas phase reactor in which an olefin polymerization reaction is in progress is the first reactor in a multiple series reactor configuration.

11. The process of Claim 10 wherein said multiple series reactor configuration is a dual series reactor configuration.